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EXAMINER

JERABEK, KELLY L

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2612

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/558,434  
Filing Date: April 25, 2000  
Appellant(s): SPEARS ET AL.

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Augustus W. Winfield  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 7/11/2005 appealing from the Office action mailed 7/1/2004.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,308,970	Pool	05-1994
4,689,686	Hashimoto et al.	08-1987
6,351,284	Watanabe et al.	02-2002
4,573,078	Rentsch et al.	02-1986
5,272,535	Elabd	12-1993

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**Claims 1,4, and 5 rejected under 35 U.S.C. 103(a) as being anticipated by Pool US 5,308,970.**

Re claim 1, Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A first portion of charges (42) from the array of photosensors is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a second portion of charges (44) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). Pool also states that image data may be read out of register (44) and "dark current" charge may be dumped from register (42) into the sink (54) (col. 4, lines 2-4). Therefore, the first portion of charges (42) may be dumped and the second portion of charges (44) may be shifted to the amplifier. As far as exposing the array of photosensors to light from the image again, the examiner takes

Art Unit: 2612

Official Notice that it is well known in the art for imaging sensors to be exposed to light during different intervals. The invention according to Pool provides a CCD including an imaging section in which pockets of charge are produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines 61-64). The pockets of charges (charges produced by the incidence of light upon the device or parasitic charges) from the image section (CCD) are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since pockets of charges are formed by light incident on an imaging sensor (CCD) it would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor (CCD) disclosed by Pool to be exposed to light on several different occasions. Doing so would provide a means for either reading out or dumping pockets of charge produced by a CCD array that is exposed multiple times (col. 2, lines 41-64).

Re claim 4, the examiner takes Official Notice that it is well known in the art for imaging sensors and the images that they are capturing to both stay stationary between the steps of exposure. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor of Pool to capture multiple images in which there was no relative movement between the array of photosensors and the image between the steps of exposing.

Re claim 5, the examiner takes Official Notice that it is well known in the art for either the imaging sensors or the images that they are capturing to move between the steps of exposure. It would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor of Pool to capture multiple images in which there was relative movement between the array of photosensors and the image between the steps of exposing.

**Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Pool in view of Hashimoto et al. US 4,689,686.**

Pool teaches a CCD with bi-directional readout as in claim 1, but does not state that the step of dumping consists of shifting charges from the array of photosensors at a shift rate that is higher than a normal shift rate.

Hashimoto discloses an image pickup apparatus (fig. 2). The image pickup apparatus includes a drive circuit (36) for setting the readout speed to be higher than the standard readout speed (col. 7, lines 55-65). Therefore, it would have been obvious for one skilled in the art to have been motivated to include a drive circuit that increases the shift rate of the photosensor array as taught in Hashimoto in the bi-directional CDD disclosed by Pool. Doing so would provide a means for obtaining object information in a short time with low electric power consumption (Hashimoto: col. 2, lines 20-23).

**Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Pool in view of Watanabe et al. US 6,351,284.**

Pool teaches a CCD with bi-directional readout as in claim 1, but does not state that the step of dumping consists of discharging, simultaneously, a portion of charges from the array of photosensors.

Watanabe discloses a method and apparatus for driving a solid-state image sensor. The disclosed solid-state image sensor includes individual light-receiving pixels that can be simultaneously discharged (col. 2, lines 26-31). Therefore, it would have been obvious to include an array of photosensors that can be simultaneously discharged as taught in Watanabe in the bi-directional CDD disclosed by Pool. Doing so would provide an alternate means for transferring charge packets in an image sensor (Watanabe: col. 1, lines 6-11).

#### **(10) Response to Argument**

On page 4 of the Brief, Appellant states that the Pool reference does not teach or suggest dumping a portion of the charges **from the photosensors**. Appellant states that in the Pool reference the charges being dumped are thermal noise (dark current) charges that are not generated from the photosensors. The Examiner agrees with the statement that the dark current charges are not generated from the photosensors, however the claim does not require that the charges be from the photosensors



themselves but rather claim 1 states that the charges are from **an array of photosensors**. Therefore, the Examiner believes that the charges disclosed in the Pool reference meet the limitations of claim 1.

Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A portion of charges (pockets of charge from the image section (40)) from an array of photosensors (CCD array) is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a portion of charges (dark current) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). **Pool states that the “dark current” is generated due to thermal effects in the CCD substrate (col. 3, lines 50-57). The Examiner is reading the entire CCD array (which includes the CCD substrate) as an array of photosensors. Therefore, it can be seen that the “dark current” that is dumped is a portion of charges that are from an array of photosensors.** Pool also states that image data may be read out of either register (42,44) and “dark current” charge may be dumped from either register (42,44) into the sink (54) (col. 4, lines 2-29). Therefore, in a first instant, the first portion of charges (charges sent through register 42) consist of the “dark current” charges and are dumped and the second portion of charges (charges sent through register 44) consist of the pockets of charge from the image section and are shifted to the amplifier. In a second instant, the first portion of charges (charges sent through register 42) consist of the pockets of charge from the image section and are shifted to the amplifier and the second portion of charges (charges sent through register 44) consist of the “dark current” charges and are dumped.

On page 5 of the Brief, Appellant states that in the time delay integration context disclosed by the Pool reference, there is no teaching or suggestion for first and second exposures of the photosensors to the same image. Appellant further states that although the Pool reference teaches that the two different registers will either read out charge or dump charge according to the direction of charge transfer, the reference does not explicitly teach a scenario in which the same image would be exposed twice, once in each direction. The Examiner agrees that the Pool reference does not explicitly teach multiple exposures for one image, however Official Notice was taken that it is well known in the art for imaging sensors to be exposed to light from the same image multiple times. The Applicant did not traverse the Examiner's assertion of the official notice in the amendment filed 4/29/2004, thus the well-known in the art statement is taken to be admitted prior art because the Applicant failed to traverse the Examiner's assertion of the official notice (MPEP 2144.03 (c)). Therefore, although the Pool reference does not explicitly teach first and second exposures of photosensors to the same image, the combination of the Pool reference and the admitted prior art of imaging sensors being exposed to light from the same image multiple times disclose all of the limitations of claim 1.

On page 5 of the Brief, Appellant states that in order to establish a prima facie case of obviousness the prior art must teach or suggest all the steps of claim 1 and that if the location of the second exposure step within the sequence is ignored, then both the

Art Unit: 2612

first and second portions of the charges from the photosensors are dumped. First, claim 1 as written does not deal with only charges from the photosensors themselves but rather it deals with charges from **an array of photosensors**. The Examiner agrees with the assessment that the location of the second exposure step should not be ignored. In paper 9, page 3, the Examiner was attempting to state that although the steps of shifting a first portion of charges and dumping a second portion of charges were mentioned before the steps of dumping the first portion of charges and shifting the second portion, there is no implied order in the steps and thus the shifting and dumping operations could be reversed. The Examiner is rejecting claim 1 in the following way:

Pool discloses in figure 1 a CCD image sensor (10) that is exposed to light from an image (col. 1, lines 10-13). A portion of charges (pockets of charge from the image section (40)) from an array of photosensors (CCD array) is shifted to an amplifier via a common output (col. 3, line 68, col. 4, lines 1-2; fig. 4: 42 and 48). Also a portion of charges (dark current) is dumped into a sink (col. 3, lines 61-67; fig. 4: 44 and 54). Pool states that the "dark current" is generated due to thermal effects in the CCD substrate (col. 3, lines 50-57). The Examiner is reading the entire CCD array (which includes the CCD substrate) as an array of photosensors. Therefore, it can be seen that the "dark current" that is dumped is a portion of charges that are from an array of photosensors. Pool also states that image data may be read out of either register (42,44) and "dark current" charge may be dumped from either register (42,44) into the sink (54) (col. 4, lines 2-29). Therefore, in a first instant, the first portion of charges (charges sent

Art Unit: 2612

through register 42) consist of the "dark current" charges and are dumped and the second portion of charges (charges sent through register 44) consist of the pockets of charge from the image section and are shifted to the amplifier. In a second instant, the first portion of charges (charges sent through register 42) consist of the pockets of charge from the image section and are shifted to the amplifier and the second portion of charges (charges sent through register 44) consist of the "dark current" charges and are dumped. As far as exposing the array of photosensors to light from the image again, the examiner takes Official Notice that it is well known in the art for imaging sensors to be exposed to light during different intervals. The invention according to Pool provides a CCD including an imaging section in which pockets of charge are produced by the incidence of light upon the device (col. 2, lines 41-50). Other pockets of charge (parasitic charge) in the imaging section may be dumped into a sink (col. 2, lines 61-64). The pockets of charges (charges produced by the incidence of light upon the device or parasitic charges) from the image section (CCD) are then sent through registers (42, 44) and are either shifted to the amplifier or dumped into a sink (col. 3, line 61 – col. 4, line 4). Therefore, since pockets of charges are formed by light incident on an imaging sensor (CCD) it would have been obvious to one of ordinary skill in the art at the time of invention for the imaging sensor (CCD) disclosed by Pool to be exposed to light on several different occasions. Doing so would provide a means for either reading out or dumping pockets of charge produced by a CCD array that is exposed multiple times (col. 2, lines 41-64).

On page 6 of the Brief, Appellant states, regarding claim 4, that although the Appellant agrees that it is well known in the art for a stationary camera to take two exposures of the same image, the Examiner rejected claim 4 in light of Pool and Pool does not teach or suggest no relative movement. The Examiner agrees that the Pool reference does not explicitly teach multiple exposures for one image, however Official Notice was taken that it is well known in the art for imaging sensors to be exposed to light from the same image multiple times and for imaging sensors and the images that they are capturing to both stay stationary between the steps of exposure. The Applicant did not traverse the Examiner's assertion of the official notice in the amendment filed 4/29/2004, thus the well-known in the art statement is taken to be admitted prior art because the Applicant failed to traverse the Examiner's assertion of the official notice (MPEP 2144.03 (c)). Therefore, although the Pool reference does not explicitly teach first and second exposures of photosensors to the same image where there is no relative movement between the array and the image between the steps of exposing, the combination of the Pool reference and the admitted prior art of imaging sensors being exposed to light from the same image multiple times where there is no relative movement between the array and the image disclose all of the limitations of claim 4.

**(11) Related Proceeding(s) Appendix**

There are no related proceedings.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
Kelly Jerabek

September 9, 2005

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